CLAIMS

What is claimed is:

1. A power control system for a power amplifier, comprising:

a first power control loop comprising:

a variable attenuator for adjusting a gain applied to a signal in the first power control loop;

a detector for providing a direct current (DC) baseband signal representing an output of the power amplifier;

a first comparator for comparing the DC baseband signal to a first reference signal and generating an error signal;

a second power control loop comprising:

a second comparator for comparing the error signal to a second reference signal and generating a secondary control signal capable of controlling the variable attenuator.

2. The power control system of claim 1, wherein the secondary control signal is used to control the variable attenuator to reduce attenuation in the first power control loop.

3. The power control system of claim 2, wherein the variable attenuator is a variable gain amplifier (VGA) having a maximum gain of zero dB.

4. The power control system of claim 1, further comprising an adjustable buck voltage converter responsive to the secondary control signal, the adjustable buck voltage converter configured to reduce a power supplied to the power amplifier in response to the secondary control signal.

5. The power control system of claim 4, wherein the adjustable buck voltage converter reduces supply current to the power amplifier until saturation of the power amplifier is detected.

6. The power control system of claim 1, wherein the secondary control signal is used to control the variable attenuator to reduce attenuation in the first power control loop, and further comprising:

an adjustable buck voltage converter responsive to the secondary control signal, the adjustable buck voltage converter configured to reduce the power supplied to the power amplifier in response to the secondary control signal until saturation of the power amplifier is detected.

7. A method for operating a power control loop for a power amplifier, comprising:

measuring a power level of a signal output from the power amplifier;

generating an error signal by comparing the power level of the signal output from the power amplifier to a first reference signal; and

deriving a secondary control signal.

8. The method of claim 7, further comprising:

using the secondary control signal to control a gain applied to the signal output from the power amplifier.

9. The method of claim 8, wherein the gain applied to the signal output from the power amplifier is controlled by a variable attenuator, the variable attenuator configured to receive the signal output from the power amplifier.

10. The method of claim 7, further comprising:

using the secondary control signal to control an adjustable buck voltage converter, the adjustable buck voltage converter configured to provide a supply current to the power amplifier.

11. The method of claim 10, wherein the adjustable buck voltage converter reduces supply current to the power amplifier until saturation of the power amplifier is detected.

12. The method of claim 7, further comprising:

using the secondary control signal to control a gain applied to the signal output from the power amplifier; and

using the secondary control signal to control an adjustable buck voltage converter, the adjustable buck voltage converter configured to provide a supply current to the power amplifier, wherein the adjustable buck voltage converter reduces supply current to the power amplifier until saturation of the power amplifier is detected.

13. A system for operating a power control loop for a power amplifier, comprising:

means for measuring a power level of a signal output from the power amplifier;

means for generating an error signal by comparing the power level of the signal output from the power amplifier to a first reference signal; and

means for deriving a secondary control signal.

14. The system of claim 13, further comprising:

means for using the secondary control signal to control a gain applied to the signal output from the power amplifier.

15. The system of claim 14, wherein the gain applied to the signal output from the power amplifier is controlled by a variable attenuator means, the variable attenuator means for receiving the signal output from the power amplifier.

16. The system of claim 13, further comprising:

means for using the secondary control signal to control an adjustable buck voltage converter means, the adjustable buck voltage converter means for providing a supply current to the power amplifier.

17. The system of claim 16, wherein the adjustable buck voltage converter means reduces supply current to the power amplifier until saturation of the power amplifier is detected.

18. The system of claim 13, further comprising:

means for using the secondary control signal to control a gain applied to the signal output from the power amplifier; and

means for using the secondary control signal to control an adjustable buck voltage converter means, the adjustable buck voltage converter means for providing a supply current to the power amplifier, wherein the adjustable buck voltage converter means reduces supply current to the power amplifier until saturation of the power amplifier is detected.